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Dean W. Boyd *et al.*
Response to Office Action mailed September 25, 2006

Amendment to the Claims:

1-14.   (Cancelled)

15.   (New)   A computer-implemented method of promotion price optimization, comprising:

providing a product segmentation module to identify products to be analyzed under a plurality of promotion schemes;

providing a customer segmentation module to identify customers of the products to be analyzed under the promotion schemes;

providing an incentive translation module for providing incentive typing of the products to be analyzed under the promotion schemes by collecting incentive offers for promotion programs over a time period and transforming the promotion programs to fit market modeling requirements;

providing a data aggregation module to evaluate historical promotional transactions by aggregating product data for the products to be analyzed under the promotion schemes;

providing a model selection module to select a model for analyzing the aggregated product data by the steps of,

(a)   selecting a standard model if product data is unavailable,

(b)   selecting sales volume as a dependent variable and evaluate using a multiplicative model if product data is available and complete,

(c)   selecting sales volume as a dependent variable and evaluate using a multiplicative model if product data is available but incomplete and product segments are cross-impacted,

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(d) selecting market share as a dependent variable and evaluate using a multiplicative model if product data is available but incomplete and product segments are not cross-impacted but the number of products to evaluate exceeds a predetermined maximum value, and

(e) selecting market share as a dependent variable and evaluate using an attraction model if product data is available but incomplete and product segments are not cross-impacted and the number of products to evaluate is less than the predetermined maximum value;

providing a calibration module to calibrate the selected model by determining values for dependent variables used in analyzing the aggregated product data within the selected model;

providing an evaluation module to estimate an effect of promotional schemes on profits by evaluating the aggregated product data in accordance with the selected model;

providing a constraints generation module for a user to define constraints on variables in the selected model;

providing a cost structure module to determine costs associated with the promotion schemes; and

providing an optimization module to determine optimal discount for the products to be analyzed under the promotion schemes and rank the products by profitability.

16. (New) The computer-implemented method of claim 15, wherein the step of providing the product segmentation module further includes:

receiving and storing product data in a database;

organizing the product data in the database into product segments by behavior, attributes, and features;

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determining promotion impact factors across the product segments; and

identifying target products for promotion price optimization based on the promotion impact factors.

17. (New) The computer-implemented method of claim 15, wherein the step of providing the customer segmentation module further includes:

segmenting the customers by demographics and market characteristics into characteristic-based segments;

organizing the customers in a database;

dividing the customers into global segments, each global segment including a plurality of characteristic-based segments;

determining global segments having cross-impact between customers; and

eliminating the global segments having cross-impact between customers.

18. (New) The computer-implemented method of claim 15, wherein the incentive offers are selected from the group consisting of rebates, discounts, low-rate financing, bundled goods, and non-monetary promotions.

19. (New) The computer-implemented method of claim 15, wherein the step of providing the data aggregation module further includes:

separating product data from the historical promotional transactions into customer segments;

determining time intervals for aggregating the product data;

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aggregating target product data over each time interval;

aggregating competitor product data over each time interval;

determining market share for the target product and competitor product for each customer segment;

determining average pricing and incentive offers for the target product and competitor product over each time interval; and

determining patterns in average pricing and incentive offers for the target product and competitor product.

20. (New) The computer-implemented method of claim 15, wherein the multiplicative model is defined as:

$$Y_i = \exp(\alpha_i + \varepsilon_i) * \prod_{k=1}^{K} X_{ki}^{\beta k}$$

21. (New) The computer-implemented method of claim 15, wherein the attraction model is defined as:

$$A_i = \exp(\alpha_i + \varepsilon_i) * \prod_{k=1}^{K} f_k(X_{ki})^{\beta_k}$$

22. (New) The computer-implemented method of claim 15, wherein the attraction model is defined as:

$$A_i = \exp(\alpha_i + \varepsilon_i) * \prod_{k=1}^{K} f_k(X_{ki})^{\beta_{ki}}$$

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23. (New) The computer-implemented method of claim 15, wherein the attraction model is defined as:

$$A_i = \exp(\alpha_i + \varepsilon_i) * \prod_{k=1}^{K} \prod_{j=1}^{m} f_k(X_{ki})^{\beta_{ki}}$$

24. (New) The computer-implemented method of claim 15, wherein the step of providing the evaluation module further includes:

receiving data from the user including sales volume and promotion information, user-defined values for model variables, and user-defined business goals; and

performing profit maximization analysis on the received data to estimate expected revenues attributable to the promotion schemes.

25. (New) The computer-implemented method of claim 24, wherein the step of providing the evaluation module further includes:

interacting with demand forecaster to predict customer demand and alert to potential supply issues;

interacting with market manager to control inventory supply levels; and

integrating the demand forecaster and market manager into the profit maximization analysis.

26. (New) The computer-implemented method of claim 15, wherein the step of providing the optimization module further includes:

defining business rules and constraints for the plurality of promotion schemes; and

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determining an optimal promotion scheme from the plurality of promotion schemes that maximizes profit within the business rules and constraints.

27. (New) The computer-implemented method of claim 26, wherein the business rules and constraints include volume, fixed incentive levels, equality on incentive levels, minimum and maximum incentive levels, fixed margins, and minimum and maximum margins.

28. (New) The computer-implemented method of claim 15, further including providing a market channel performance module to maximize market investment return for the products to be analyzed under the promotion schemes.

29. (New) The computer-implemented method of claim 15, further including providing an alert module to notify the user as to market trends involving the products to be analyzed under the promotion schemes.

30. (New) A computer-implemented method of promotion price optimization, comprising:

identifying products to be analyzed under a plurality of promotion schemes;

identifying customers of the products to be analyzed under the promotion schemes;

providing for incentive typing of the products to be analyzed under the promotion schemes;

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evaluating historical promotional transactions by aggregating product data for the products to be analyzed under the promotion schemes;

selecting a model for analyzing the aggregated product data;

calibrating the selected model by determining values for dependent variables used in analyzing the aggregated product data within the selected model;

estimating an effect of promotional schemes on profits by evaluating the aggregated product data in accordance with the selected model;

defining constraints on variables in the selected model, wherein the constraints are defined by a user;

determining costs associated with the promotion schemes; and

determining optimal discount for the products to be analyzed under the promotion schemes and ranking the products by profitability.

31. (New) The computer-implemented method of claim 30, wherein user-defined constraints are selected from the group consisting of unconstrained, bounded constrained, constrained, mixed-discrete, and non-linear.

32. (New) The computer-implemented method of claim 30, wherein the step of selecting a model further includes:

selecting a standard model if product data is unavailable;

selecting sales volume as a dependent variable and evaluate using a multiplicative model if product data is available and complete;

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selecting sales volume as a dependent variable and evaluate using a multiplicative model if product data is available but incomplete and product segments are cross-impacted;

selecting market share as a dependent variable and evaluate using a multiplicative model if product data is available but incomplete and product segments are not cross-impacted but the number of products to evaluate exceeds a predetermined maximum value; and

selecting market share as a dependent variable and evaluate using an attraction model if product data is available but incomplete and product segments are not cross-impacted and the number of products to evaluate is less than the predetermined maximum value.

33. (New) A computer-implemented method of promotion price optimization, comprising:

identifying products to be analyzed under a plurality of promotion schemes;

selecting a model for analyzing the products under the promotion scheme;

defining constraints on variables in the selected model, wherein the constraints are defined by a user; and

determining optimal discount for the products to be analyzed under the promotion schemes and ranking the products by profitability.

34. (New) The computer-implemented method of claim 33, further including:

identifying customers of the products to be analyzed under the promotion schemes;

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providing for incentive typing of the products to be analyzed under the promotion schemes;

evaluating historical promotional transactions by aggregating product data for the products to be analyzed under the promotion schemes;

calibrating the selected model by determining values for dependent variables used in analyzing the aggregated product data within the selected model;

estimating an effect of promotional schemes on profits by evaluating the aggregated product data in accordance with the selected model; and

determining costs associated with the promotion schemes.

35.   (New)   The computer-implemented method of claim 33, further including defining optimization conditions for the selected model, wherein the optimization conditions are defined by the user.

36.   (New)   The computer-implemented method of claim 33, wherein user-defined constraints are selected from the group consisting of unconstrained, bounded constrained, constrained, mixed-discrete, and non-linear.

37.   (New)   The computer-implemented method of claim 33, wherein the step of selecting a model further includes:

selecting a standard model if product data is unavailable;

selecting sales volume as a dependent variable and evaluate using a multiplicative model if product data is available and complete;

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selecting sales volume as a dependent variable and evaluate using a multiplicative model if product data is available but incomplete and product segments are cross-impacted;

selecting market share as a dependent variable and evaluate using a multiplicative model if product data is available but incomplete and product segments are not cross-impacted but the number of products to evaluate exceeds a predetermined maximum value; and

selecting market share as a dependent variable and evaluate using an attraction model if product data is available but incomplete and product segments are not cross-impacted and the number of products to evaluate is less than the predetermined maximum value.

38.   (New)   A computer program product usable with a programmable computer processor having a computer readable program code embodied therein, comprising:

computer readable program code which identifies products to be analyzed under a plurality of promotion schemes;

computer readable program code which identifies customers of the products to be analyzed under the promotion schemes;

computer readable program code which selects a model for analyzing the aggregated product data;

computer readable program code which calibrates the selected model by determining values for dependent variables used in analyzing the aggregated product data within the selected model;

computer readable program code which estimates an effect of promotional schemes on profits by evaluating the aggregated product data in accordance with the selected model;

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computer readable program code which provides for user-defined constraints on variables in the selected model;

computer readable program code which determines costs associated with the promotion schemes; and

computer readable program code which determines optimal discount for the products to be analyzed under the promotion schemes and ranks the products by profitability.

39.   (New)   The computer program product of claim 38, wherein user-defined constraints are selected from the group consisting of unconstrained, bounded constrained, constrained, mixed-discrete, and non-linear.

40.   (New)   The computer program product of claim 38, further including computer readable program code which provides for user-defined optimization conditions for the selected model.

41.   (New)   The computer program product of claim 38, wherein the computer readable program code further includes:

selecting a standard model if product data is unavailable;

selecting sales volume as a dependent variable and evaluate using a multiplicative model if product data is available and complete;

selecting sales volume as a dependent variable and evaluate using a multiplicative model if product data is available but incomplete and product segments are cross-impacted;

selecting market share as a dependent variable and evaluate using a multiplicative model if product data is available but incomplete and product segments are not cross-impacted but the

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number of products to evaluate exceeds a predetermined maximum value; and

selecting market share as a dependent variable and evaluate using an attraction model if product data is available but incomplete and product segments are not cross-impacted and the number of products to evaluate is less than the predetermined maximum value.

42. (New) A computer system for promotion price optimization, comprising:

means for identifying products to be analyzed under a plurality of promotion schemes;

means for identifying customers of the products to be analyzed under the promotion schemes;

means for selecting a model for analyzing the aggregated product data;

means for calibrating the selected model by determining values for dependent variables used in analyzing the aggregated product data within the selected model;

means for estimating an effect of promotional schemes on profits by evaluating the aggregated product data in accordance with the selected model;

means for a user to define constraints on variables in the selected model;

means for determining costs associated with the promotion schemes; and

means for determining optimal discount for the products to be analyzed under the promotion schemes and ranking the products by profitability.

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43. (New) The computer system of claim 42, wherein user-defined constraints are selected from the group consisting of unconstrained, bounded constrained, constrained, mixed-discrete, and non-linear.

44. (New) The computer system of claim 42, further including means for the user to define optimization conditions for the selected model.

45. (New) The computer system of claim 42, further including:

means for selecting a standard model if product data is unavailable;

means for selecting sales volume as a dependent variable and evaluate using a multiplicative model if product data is available and complete;

means for selecting sales volume as a dependent variable and evaluate using a multiplicative model if product data is available but incomplete and product segments are cross-impacted;

means for selecting market share as a dependent variable and evaluate using a multiplicative model if product data is available but incomplete and product segments are not cross-impacted but the number of products to evaluate exceeds a predetermined maximum value; and

means for selecting market share as a dependent variable and evaluate using an attraction model if product data is available but incomplete and product segments are not cross-impacted and the number of products to evaluate is less than the predetermined maximum value.